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Monograph on High-Frequency Seafloor Acoustics

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LONG-TERM GOALS

This monograph will be part of a series on underwater acoustics being supported by ONR-OA. It will provide an in-depth review of the current state of data and models for acoustic interaction with the seafloor at high frequencies.

OBJECTIVES

The monograph will cover geoacoustics and acoustics, measurements and modeling. The acoustics chapters will treat attenuation and dispersion in sediments, reflection loss, scattering into the water column, and penetration into the sediment.

APPROACH

This work is a collaboration with Mike Richardson of NRL-SSC. Darrell Jackson is primarily responsible for acoustic issues while Mike Richardson (under separate funding) is primarily responsible for geoacoustic issues. The main text will summarize the current state of data and models, and complex derivations and tables will be placed in appendices. Extensive use will be made of illustrative figures.

WORK COMPLETED

Rough, partial versions have been completed of an introductory chapter and chapters giving overviews of seafloor acoustics, physical properties, and measurements. A chapter on fluid sediment models is nearly complete, excluding statistical treatment of scattering, which will be placed in a separate chapter. A parallel chapter on elastic and poroelastic models is partially complete. Appendices have been written on transducers, signal processing, units, far-field issues, and ocean acoustic measurements, and an extensive bibliography has been assembled.

RESULTS

The planned format will provide convenient access to data and models while also providing in-depth explanation via extensive appendices.

IMPACT/APPLICATIONS

This book should facilitate the initial efforts of new investigators, particularly students, and provide a much-needed reference for established researchers.

RELATED PROJECTS

The monograph will incorporate newly published results of investigators supported under the ONR High-Frequency Sediment Acoustics Departmental Research Initiative.